

if (i == j)

Compiler notes

z = 0;

else

z = 1;

↳ \tif (i == j) \n \t \t z = 0; \n \t else \n \t \t z = 1;

identifier \rightarrow string of letters or digits. start with a letter

integer \rightarrow non-empty string of digits

Keyword \rightarrow else, if (begin).

Whitespace \rightarrow non empty sequence of blanks, newline and tabs.

ex $x = 0, \backslash n \backslash t \text{ while } (x < 10) \{ \backslash n \backslash t x++ \backslash n \}$

Keyword $\Rightarrow 1 \Rightarrow \text{while}$

identifier $\Rightarrow 3 \Rightarrow x$ three times.

other token $\{ \{ \}, (), <, ++, \text{etc.} \} \Rightarrow 9$

Whitespace $\Rightarrow 3$

b

$$((0+1)[0-9] + 1[0-2]) : [0-5][0-9] (AM+PM)$$

\downarrow or \downarrow 12

— النظام سليم ومرتبطه للبايزية .

c

$$(0^* [0-9] + 1[0-2]) : [0-5][0-9] (AM+PM)$$

$$0^* \Rightarrow 00:01 \quad \text{XX}$$

— النظام ده غير مرتبطه

$$d) 0?[0-9] + 1(0+1+2) : [0-5][0-9] (A+P)M$$

له غير مرتبطه .

* state 

* start state



* accept state



* transition



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→ Finite automata accepts only one "1"



→ Accept any number of 1's Followed by single 0.

* Deterministic Finite Automata (DFA)

a) one transition per input per state

b) No ϵ moves.



* Non-deterministic Finite Automata (NFA)

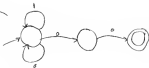
a) Can have ϵ moves

b) multiple transitions for one input in a given state



NFA

عشان يكون 2 transition
لا (zero) في البداية



DFA



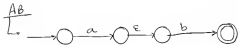
Accepted -- لو آخر حالة فيها (accept state)

Rejected -- لو وصلت للحالة وبعدين (Accept state)
لو انا اصل حالة في (string) حتى لو دخلت (Accept state)

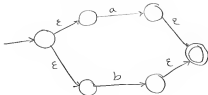
AB



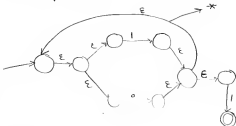
5



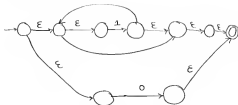
A + B

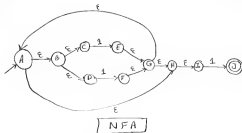


$$\Rightarrow (1 + a)^* |$$



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ϵ -closure $\{s\}$

همه حالت‌های (states) که از state s به وسیله ϵ قابل دسترسی هستند
 به غیر از حالت s

$$\epsilon\text{-closure} \{B\} = \{B, C, D, A\}$$

$$\epsilon\text{-closure} \{G\} = \{G, H, I, A, B, C, D\}$$

$a(X)$ \rightarrow set of states

~~epsilon closure~~

X

همه حالت‌های خروجی، به غیر از x و x (small character)

B

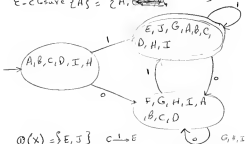
$$\alpha(X) = \{y \mid x \in X_n \quad x \xrightarrow{a} y\}$$

$$= Y$$

تجميع غير مباشر
E-closure $\{Y\}$

→ To transform previous Drawing From NFA to DFA

$$E\text{-closure}\{A\} = \{A, \text{B, C, D, H, I}\}$$



$$\alpha(X) = \{E, J\} \quad \begin{array}{l} C \xrightarrow{1} E \\ I \xrightarrow{1} J \end{array}$$

$$E\text{-closure}\{\alpha(X)\}$$

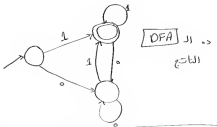
$$E\text{-closure}\{E, J\}$$

$\{E, J, G, A, B, C, D, H, I\}$

E, J غير مباشر

$\alpha(X)$ غير مباشر

و E-closure

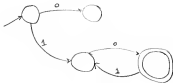
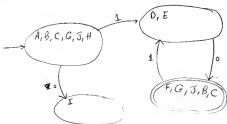


FF



$$\epsilon\text{-closure}\{A\} = \{A, B, C, G, J, H\}$$

(10)



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